Agenda

- Introduction
- Photovoltaics
- ESPC Model
- Integrated ESPC Program for Navy Region Southwest (NRSW)
- Effectiveness of ESPC Model for DG/CHP Projects

Introduction

- Project Overview
- Facility Profile

Project Overview

- Facility Type: Navy Region Southwest (NRSW)
- Contract: Department of Energy (DoE) Western Region Super ESPC
- Prime Contractor: NORESCO Developed, Designed, Implemented, Commissioned, Financed and Guaranteed Savings for Project
- Project: $22 million Multiple Technology Integrated ESPC Program
  - Cornerstone PV Project Opened Door to Facility-Wide Energy Retrofit
  - Other Integrated ESPC Measures Include:
    - Lighting Upgrade including Skylights and Controls
    - Microturbine CHP System
    - Irrigation Upgrade, Expansion and Control System
    - Conversion of HVAC System to VAV
    - Chiller Replacements
    - Air Compressor System Upgrades

Facility Profile

- Facility Size: 9,500,000 sq. ft.
- NAS North Island
  - 25+ MW Peak Demand
  - Over 200,000,000 kWh/year
  - $20 – $25 Million Electric Bill
- NAB Coronado
  - 5 MW Peak Demand
  - 25,000,000 kWh/year
  - $4 Million Electric Bill

Photovoltaics

- 30 kW Rooftop System
- 750 kW Covered Parking Structure System
- Project Benefits

30 kW System – Building 14, NAB Coronado

- System Ratings:
  - 30.1 kW(ac) Output
  - 49,765 kWh Annual Production
- System Details:
  - 275 – 109.3W PV Modules
  - Model PL-AP-130

30 kW System – Building 14, NAB Coronado

750 kW System – NAS North Island

- System Ratings:
  - 750 kW(ac) Output
  - 1,244,000 kWh Annual Production
- System Details:
  - Largest PV System in the Federal Government
  - 3,078 – 300W PV Modules
  - Model ASE-300-DG/50
  - Covered Parking Structure for 400 Spaces

750 kW System – NAS North Island

Project Benefits

- Provides Both Bases 1,293,765 kWh per Year of Clean Power
  - 3% of NASNI Peak Demand
  - 1% of NASNI Power Consumption
- Reduces Air Emissions
  - 309 Tons of CO_2 per year
  - 486 lbs of NO_x per year
  - 54 lbs of SO_x per year
- Provides Sources of On-Base Power
- Reduces Vulnerability to Disruptions to Off-Base Power Grid
- Facility Demonstrates Strong Environmental Commitment

ESPC Model

- Goals and Objectives
- Benefits of ESPC
- Cash Flow Example
- Distributing Account Funding Example

Goals and Objectives

- Energy and Environmental
  - Save Energy
  - Reduce Pollution
- Upgrade Energy Infrastructure
  - Comprehensive & Integrated Evaluation of all ECMs
  - Replace Failed, Worn, Antiquated Equipment
  - Reduce Deferred Maintenance Burdens / Provide Operation, Maintenance and Repair Burden Relief
  - Improve System and Mission Reliability and Security
- Financial
  - Save Money with Verifiable Energy and Ancillary Cost Savings
  - Obtain All Available Rebates/Incentives
  - Unleash Private Sector Investment in Government Facilities
  - Leverage Limited Capital Funding

Benefits of ESPC

- Maximum Contract Term of Up To 25 years – Supports Extensive Infrastructure Upgrades and Major System Improvements.
- ESCO Responsible for Development, Design, Turnkey Installation, Commissioning and Proper Operation before Payments Made.
- Bundling Long and Short Payback Projects to Achieve a Combined Payback that is Acceptable and Financeable (Provides Leverage for Longer Payback DG/CHP and Central Plant Type Infrastructure Projects).
- Warrantees, OM&R and Annual M&V Ensures Savings Persistence.
- Emphasis on Solving both Short- and Long-Term Problems.
- Rational and Economic Allocation and Risk Sharing of OM&R.
- Service Phase Component Allows for Budgeting for Long-Term OM&R.
- Truly a Long-Term Partnership Between Facility and ESCO.

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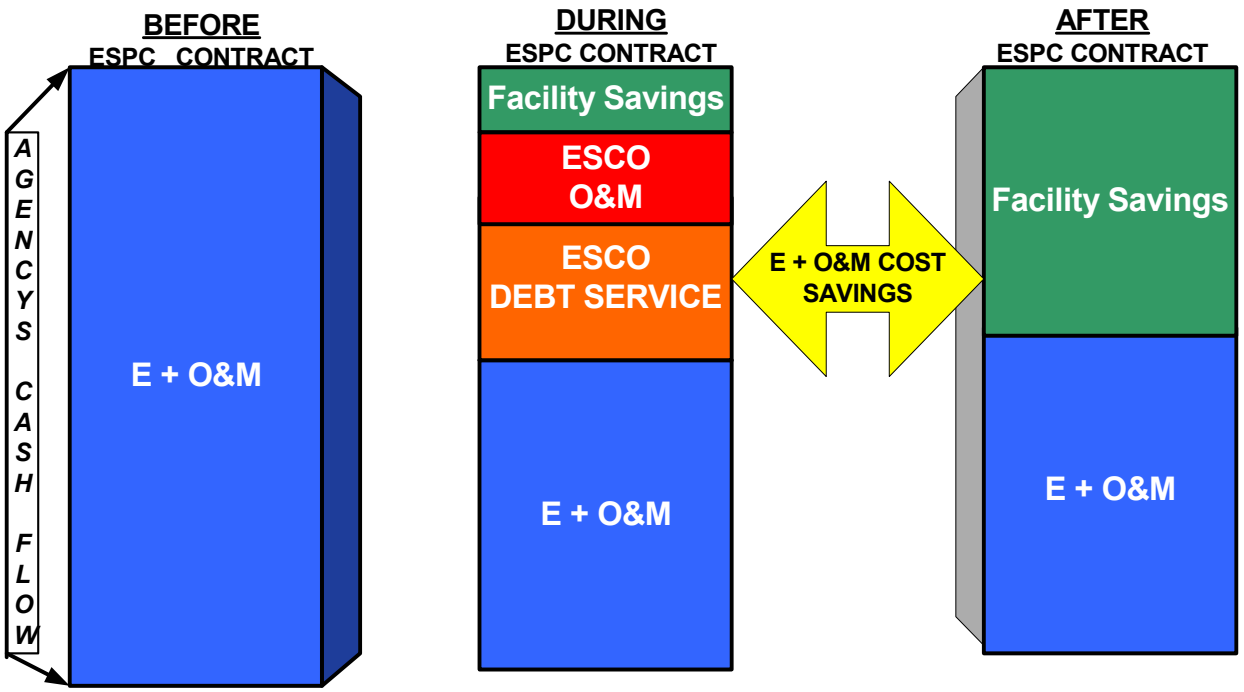
Cash Flow Example

ESPC reallocates the utility and O&M bill to:

- Pay a lower utility bill
- Reduce O&M Cost
- Pay the contractor
- Achieve cost savings for the Customer



Project Costs Paid From Existing Energy / O&M Budgets.

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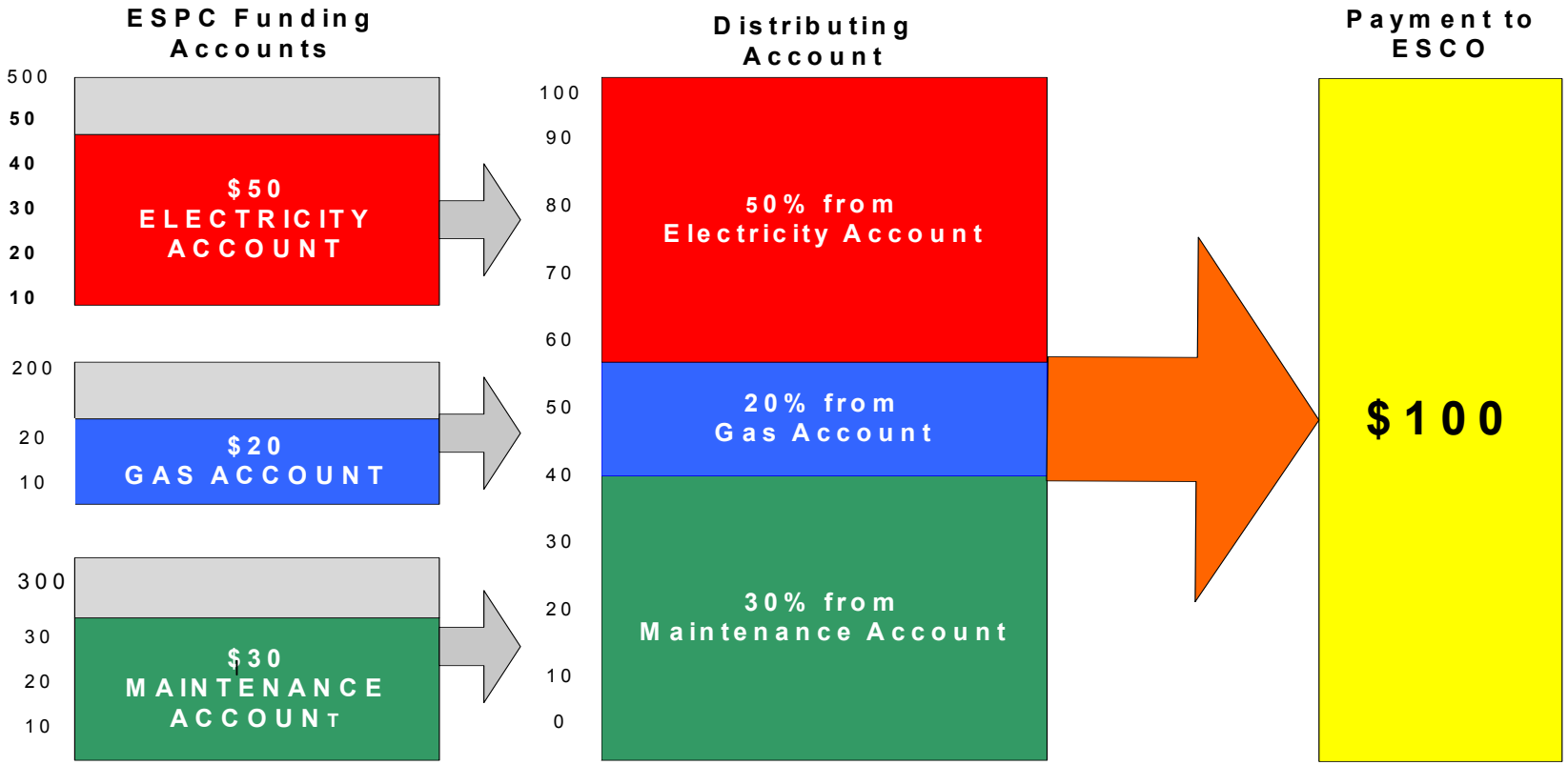
Distributing Account Funding Example



A Distributing account is a technique for simplifying payments that draw funds from several different sources

Integrated ESPC Program for NRSW

- Applied Technologies
- Highlighted "Green" and DG/CHP Technology Applications
- Project Economics

Applied Technologies

- 750 kW solar photovoltaic (PV) covered parking structure and a 30 kW roof mounted PV array
- Two 60 kW microturbine CHP Systems
- Energy efficient lighting upgrade of HID fixtures with Bi-level HIDs/Bi-axial T5 fluorescent fixtures, 650 skylights and lighting controls system with local control panels, automatic timer controls and daylighting controls.
- DDC upgrade with complete conversion of existing controls to a DDC system connected to an Area-Wide EMCS.
- Upgrade and expansion of existing underground irrigation system with centralized and satellite automation controls.
- Restoration and Conversion of selected HVAC systems to VAV operation through controls and VFDs.
- Replacement of air-cooled chillers with new, high efficiency models and installation of VFDs on chilled water (CHW) pumps.
- Major improvements to facility compressed air plants and systems.

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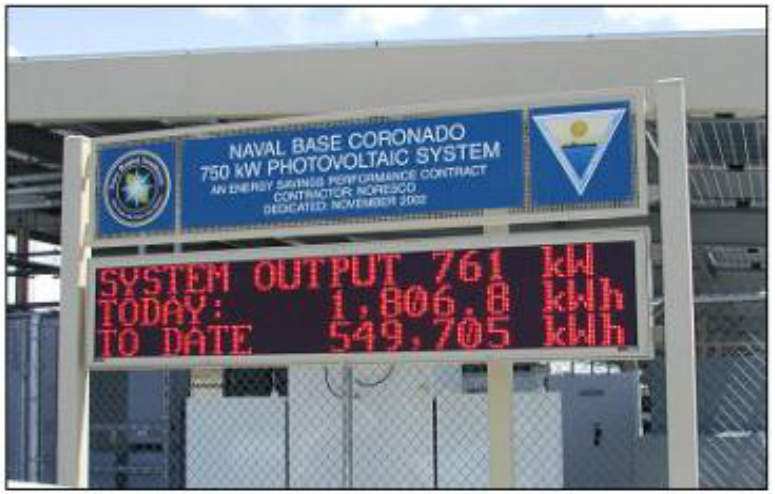
Highlighted "Green" and DG/CHP Technology Applications



Project Economics

Energy Conservation Measures (ECMs)	Total Installed Project Cost	Total Savings	Simple Payback (yrs)
Energy Efficient Lighting Upgrade & Skylights	$4,904,746	$623,532	7.9
Install DDC Controls Upgrades	$979,023	$135,115	7.2
Chiller Replacements at NAB	$431,939	$38,624	11.2
30 kW Solar Photovoltaic Array – NAB Bldg. 14	$358,407	$9,582	37.4
750 kW Solar Photovoltaic System – NASNI	$7,710,790	$228,305	33.8
Microturbine CHP System and VFDs – NAB	$662,247	$78,143	8.5
Irrigation System Upgrade and Automation	$2,978,988	$283,804	10.5
Compressed Air System Upgrade – NASNI	$1,322,469	$394,923	3.3
HVAC System Improvements – NASNI	$1,642,878	$174,817	9.4
Compressed Air System Upgrade – NAVSTA	$1,171,411	$295,745	4.0
Total Project Installed Cost	**$22,162,898**	**$2,262,590**	**9.8**
Total Navy and DoD Prepayments	$4,600,624		
DoE Grants, Utility Rebates and State Incentives	$3,930,000		
Net Remaining Project Cost	**$13,632,274**	**$2,262,590**	**6.0**
Project Financed Term	**10 Years**		

Effectiveness of ESPC Model for DG/CHP Projects

- Model Compatibility
- Keys to Success

Model Compatibility

- Ability to Use Verifiable Generated Savings to Pay for Capital Investment.
- Sufficiently Long Contract Term (Up to 25 Years).
- Design-Build Approach Allows for Fast Track Implementation.
- Best Value (Not Low Bid) Contractor Selection.
- Integrated Bundling of Long and Short Payback Projects Provides Financial Leverage for DG/CHP Projects.
- OM&R Cost and Savings Recognition, and Annual M&V Provides for Life-Cycle Accounting of Cost/Benefits.
- Provision for Long-Term Operational Reliability With Warrantees and Service Phase Budgets (Avoids Deferred Maintenance Syndrome).
- Rational and Economic Allocation of Risk.
- Ability to Engage in a True Long-Term Energy Partnership.

Keys to Success

- Viable Project
- Effective Communication
- Strong Partnership
- Willingness to Be Flexible
- Stakeholder Position
- Site/Agency Champions